AMENDMENTS TO CLAIMS

Please amend the claims as indicated hereinafter.

1.   (Currently Amended) A computer-implemented method of allocating storage to a host processor, comprising:

a control processor receiving a request to allocate storage to the host processor;

wherein the request to allocate storage indicates that the allocated storage should be at least a requested size; and

the control processor associating one or more logical units ~~from among one or more storage units to~~ with the host processor by:

the control processor selecting the one or more logical units from a plurality of logical units stored on one or more storage units,

wherein said selecting comprises determining that the one or more logical units, when combined, are of a cumulative size that is at least as great as the requested size;

the control processor configuring a gateway device to map the one or more logical units to the host processor, wherein the gateway device is a physical device;

the control processor configuring the one or more storage units to give the host processor access to the one or more logical units;

~~wherein the host processor accesses the one or more logical units, which are associated with the host processor by the control processor, without the host processor knowing which of the one or more logical units from among the one or more storage units are associated with the host processor;~~

wherein the control processor is a separate device from each of the gateway device, the host processor, and the one or more storage units; and

wherein the gateway device is a separate device from each of the control processor, the host processor, and the one or more storage units.

2.   (Previously Presented) A method as recited in Claim 1, wherein:

the control processor configuring the gateway device and the control processor
configuring the one or more storage units are performed by the control
processor without modification to an operating system of the host processor;

the gateway device is included in a virtual storage layer;

the host processor and the one or more storage units are included in a virtual server
farm;

the control processor is coupled through one or more storage networks to a plurality of
storage gateways that includes the gateway device; and

the plurality of storage gateways are coupled through the storage networks to the one
or more storage units.

3.-6.   (Cancelled)

7.   (Previously Presented) A method as recited in Claim 1, further comprising:

the control processor causing the storage of first information that associates host
processors to logical units;

the control processor causing the storage of second information that associates logical
units to storage units;

the control processor associating the one or more logical units from among the one or
more storage units to the host processor further comprises the control processor
mapping the one or more logical units from among the one or more storage
units to a boot port of the host processor by reconfiguring the gateway device
to logically couple the one or more logical units to the boot port based on the
stored first information and the stored second information;

the control processor identifying one or more logical unit numbers corresponding to
the one or more logical units;

the control processor instructing the gateway device to map the one or more logical
unit numbers to the small computer system interface port zero of the host
processor based on a unique processor identifier; and

the control processor instructing the one or more storage units to give the host
processor having the unique host identifier access to the one or more logical
unit numbers.

8.   (Previously Presented) A method as recited in Claim 1, wherein the request to allocate storage to the host processor is a first request to allocate storage to the host processor, and the method further comprises:

      based on the first request, the control processor generating a second request to allocate storage to the host processor;

      wherein the control processor is communicatively coupled to a control database;

      wherein the second request is directed from the control processor to a storage manager;

      wherein the storage manager is communicatively coupled to the control processor, the control database, and a storage network that includes the gateway device; and

      the method further comprises the control processor causing the storage manager to issue instructions to the one or more storage units to give the host processor access to the one or more logical units.

9.   (Cancelled)

10.   (Currently Amended) A method as recited in Claim 1, ~~wherein the request to allocate storage specifies a first amount of storage, and~~ wherein the control processor ~~associating~~ determining that the one or more logical units, when combined, are of a cumulative size further comprises:

the control processor identifying ~~the one~~ two or more logical units ~~of the one or more storage units~~ that, when combined, ~~have a second amount of storage that is at least as great as the first amount of storage specified in the request~~ are of the cumulative size.

11.   (Previously Presented) A method as recited in Claim 1, wherein the request is a first request, and the control processor associating the one or more logical units further comprises:

      the control processor issuing a second request to allocate one or more volumes on one of the one or more storage units;

      the control processor issuing a third request to make a concatenated volume using the one or more allocated volumes;

      the control processor causing the concatenated volume to be configured for use with the host processor;

the control processor issuing first instructions to the one or more storage units to bind
the host processor to the concatenated volume by giving the host processor
access to the concatenated volume;

the control processor issuing second instructions to the gateway device to bind the
concatenated volume to the host processor.

12.   (Previously Presented) A method as recited in Claim 11, further comprising:

the control processor determining that the second instructions have failed to bind the
concatenated volume to the host processor;

the control processor issuing third instructions to the one or more storage units to
un-bind the host processor from the concatenated volume;

the control processor determining that the first instructions have failed to bind the host
processor to the concatenated volume; and

the control processor issuing fourth instructions to the one or more storage units to
break the concatenated volume.

13.   (Cancelled)

14.   (Cancelled)

15.   (Currently amended) A method as recited in Claim 1, wherein:

the one or more logical units associated with the host processor include at least a first
logical unit from a first volume of a first storage unit of the one or more
storage units and at least a second logical unit from a second volume of a
second storage unit of the one or more storage units; and

the request to allocate storage specifies a ~~parameter selected from the group consisting
of an amount of storage to be allocated and a~~ type of storage to be allocated~~;~~

~~the control processor is separate from the gateway device, the host processor, and the
one or more storage units; and~~

~~the gateway device is separate from the control processor, the host processor, and the
one or more storage units.~~

16.–39. (Cancelled)

40.   (Currently Amended) A computer-readable medium for allocating storage to a host processor, the computer-readable medium carrying one or more sequences of instructions which, when executed by one or more processors, cause the one or more processors to carry out the steps of:

　　a control processor receiving a request to allocate storage to the host processor;

　　　　wherein the request to allocate storage indicates that the allocated storage should be at least a requested size; and

　　the control processor associating one or more logical units ~~from among one or more storage units to~~ with the host processor by:

　　　　the control processor selecting the one or more logical units from a plurality of logical units stored on one or more storage units,

　　　　　　wherein said selecting comprises determining that the one or more logical units, when combined, are of a cumulative size that is at least as great as the requested size;

　　　　the control processor configuring a gateway device to map the one or more logical units to the host processor, wherein the gateway device is a physical device;

　　　　the control processor configuring the one or more storage units to give the host processor access to the one or more logical units;

　　~~wherein the host processor accesses the one or more logical units, which are associated with the host processor by the control processor, without the host processor knowing which of the one or more logical units from among the one or more storage units are associated with the host processor;~~

　　wherein the control processor is a separate device from each of the gateway device, the host processor, and the one or more storage units; and

　　wherein the gateway device is a separate device from each of the control processor, the host processor, and the one or more storage units.

41.   (Previously Presented) A computer-readable medium as recited in Claim 40, wherein:

the control processor configuring the gateway device and the control processor
configuring the one or more storage units are performed by the control
processor without modification to an operating system of the host processor;

the gateway device is included in a virtual storage layer;

the host processor and the one or more storage units are included in a virtual server
farm;

the control processor is coupled through one or more storage networks to a plurality of
storage gateways that includes the gateway device; and

the plurality of storage gateways are coupled through the storage networks to the one
or more storage units.

42.   (Previously Presented) A computer-readable medium as recited in Claim 40, further
comprising one or more sequences of instructions which, when executed by the control one or
more processors, cause the one or more processors to carry out the steps of:

the control processor causing the storage of first information that associates host
processors to logical units;

the control processor causing the storage of second information that associates logical
units to storage units;

the instructions for the control processor associating the one or more logical units from
among the one or more storage units to the host processor further comprise one
or more sequences of instructions which, when executed by the one or more
processors, cause the one or more processors to carry out the step of the control
processor mapping the one or more logical units from among the one or more
storage units to a boot port of the host processor by reconfiguring the gateway
device to logically couple the one or more logical units to the boot port based
on the stored first information and the stored second information;

the control processor identifying one or more logical unit numbers corresponding to
the one or more logical units;

the control processor instructing the gateway device to map the one or more logical
unit numbers to the small computer system interface port zero of the host
processor based on a unique processor identifier; and

the control processor instructing the one or more storage units to give the host

processor having the unique host identifier access to the one or more logical

unit numbers.

43.   (Previously Presented) A computer-readable medium as recited in Claim 40, wherein

the request to allocate storage to the host processor is a first request to allocate storage to the

host processor, and the computer-readable medium further comprises one or more sequences

of instructions which, when executed by the one or more processors, cause the one or more

processors to carry out the step of:

> based on the first request, the control processor generating a second request to allocate
> > storage to the host processor;
> wherein the control processor is communicatively coupled to a control database;
> wherein the second request is directed from the control processor to a storage
> > manager;
> wherein the storage manager is communicatively coupled to the control processor, the
> > control database, and a storage network that includes the gateway device; and
> the computer-readable medium further comprises one or more sequences of
> > instructions which, when executed by the one or more processors, cause the
> > one or more processors to carry out the step of the control processor causing
> > the storage manager to issue instructions to the one or more storage units to
> > give the host processor access to the one or more logical units.

44.   (Cancelled)

45.   (Currently Amended) A computer-readable medium as recited in Claim 40, wherein
the request to allocate storage specifies a first amount of storage, and wherein the one or more
sequences of instructions for the control processor associating determining that the one or
more logical units, when combined, are of a cumulative size further comprise one or more
sequences of instructions which, when executed by the one or more processors, cause the one
or more processors to carry out the steps of:

the control processor identifying ~~the one~~ two or more logical units ~~of the one or more storage units~~ that, when combined, ~~have a second amount of storage that is at least as great as the first amount of storage specified in the request~~ are of the cumulative size.

46. (Previously Presented) A computer-readable medium as recited in Claim 40, wherein the request is a first request, and the instructions for the control processor associating the one or more logical units further comprise one or more sequences of instructions which, when executed by the one or more processors, cause the one or more processors to carry out the steps of:

the control processor issuing a second request to allocate one or more volumes on one of the one or more storage units;

the control processor issuing a third request to make a concatenated volume using the one or more allocated volumes;

the control processor causing the concatenated volume to be configured for use with the host processor;

the control processor issuing first instructions to the one or more storage units to bind the host processor to the concatenated volume by giving the host processor access to the concatenated volume;

the control processor issuing second instructions to the gateway device to bind the concatenated volume to the host processor.

47. (Previously Presented) A computer-readable medium as recited in Claim 46, further comprising one or more sequences of instructions which, when executed by the one or more processors, cause the one or more processors to carry out the steps of:

the control processor determining that the second instructions have failed to bind the concatenated volume to the host processor;

the control processor issuing third instructions to the one or more storage units to un-bind the host processor from the concatenated volume;

the control processor determining that the first instructions have failed to bind the host processor to the concatenated volume; and

the control processor issuing fourth instructions to the one or more storage units to
break the concatenated volume.

48.   (Cancelled)

49.   (Currently Amended) A computer-readable medium as recited in Claim 40, wherein:
the one or more logical units associated with the host processor include at least a first
logical unit from a first volume of a first storage unit of the one or more
storage units and at least a second logical unit from a second volume of a
second storage unit of the one or more storage units; and
the request to allocate storage specifies a ~~parameter selected from the group consisting
of an amount of storage to be allocated and a~~ type of storage to be allocated;
~~the control processor is separate from the gateway device, the host processor, and the
one or more storage units; and
the gateway device is separate from the control processor, the host processor, and the
one or more storage units~~.

50.   (Currently Amended) An apparatus for allocating storage to a host processor, the
apparatus comprising a control processor that is configured to carry out the steps of:
receiving a request to allocate storage to the host processor;
wherein the request to allocate storage indicates that the allocated storage
should be at least a requested size; and
associating one or more logical units ~~from among one or more storage units to~~ with the
host processor by:
selecting the one or more logical units from a plurality of logical units stored
on one or more storage units,
wherein said selecting comprises determining that the one or more
logical units, when combined, are of a cumulative size that is at
least as great as the requested size;

configuring a gateway device to map the one or more logical units to the host
processor, wherein the gateway device is a physical device;

configuring the one or more storage units to give the host processor access to
the one or more logical units;

~~wherein the host processor accesses the one or more logical units, which are~~
~~associated with the host processor by the control processor, without the host~~
~~processor knowing which of the one or more logical units from among the one~~
~~or more storage units are associated with the host processor;~~

wherein the control processor is a separate device from each of the gateway device,
the host processor, and the one or more storage units; and

wherein the gateway device is a separate device from each of the control processor,
the host processor, and the one or more storage units.

51.   (Previously Presented) An apparatus as recited in Claim 50, wherein:

configuring the gateway device and configuring the one or more storage units are
performed by the control processor without modification to an operating
system of the host processor;

the gateway device is included in a virtual storage layer;

the host processor and the one or more storage units are included in a virtual server
farm;

the control processor is coupled through one or more storage networks to a plurality of
storage gateways that includes the gateway device; and

the plurality of storage gateways are coupled through the storage networks to the one
or more storage units.

52.   (Previously Presented) An apparatus as recited in Claim 50, wherein the control
processor is further configured to carry out the steps of:

causing the storage of first information that associates processors to logical units;

causing the storage of second information that associates logical units to storage units;

wherein the control processor being configured for associating the one or more logical
units from among the one or more storage units to the host processor further
comprises configuring the control processor to carry out the step of mapping
the one or more logical units from among the one or more storage units to a
boot port of the host processor by reconfiguring the gateway device to
logically couple the one or more logical units to the boot port based on the
stored first information and the stored second information;

the control processor identifying one or more logical unit numbers corresponding to
the one or more logical units;

the control processor instructing the gateway device to map the one or more logical
unit numbers to the small computer system interface port zero of the host
processor based on a unique processor identifier; and

the control processor instructing the one or more storage units to give the host
processor having the unique host identifier access to the one or more logical
unit numbers.

53.   (Previously Presented) An apparatus as recited in Claim 50, wherein the request to
allocate storage to the host processor is a first request to allocate storage to the host processor,
and wherein the control processor is further configured to carry out the step of:

generating a second request to allocate storage to the host processor, based on the first
request;

wherein the control processor is communicatively coupled to a control database;

wherein the second request is directed from the control processor to a storage
manager; wherein the storage manager is communicatively coupled to the
control processor, the control database, and a storage network that includes the
gateway device;

the control processor is further configured to carry out the step of causing the storage
manager to issue instructions to the one or more storage units to give the host
processor access to the one or more logical units.

54.   (Cancelled)

55.   (Currently Amended) An apparatus as recited in Claim 50, ~~wherein the request to allocate storage specifies a first amount of storage, and~~ wherein the control processing being configured for ~~associating~~ determining that the one or more logical units, when combined, are of a cumulative size further comprises configuring the control processor to carry out the steps of:

> the control processor identifying ~~the one~~ two or more logical units ~~of the one or more storage units~~ that, when combined, ~~have a second amount of storage that is at least as great as the first amount of storage specified in the request~~ are of the cumulative size.

56.   (Previously Presented) An apparatus as recited in Claim 50, wherein the request is a first request, and configuring the control processor for associating the one or more logical units further comprises configuring the control processor to carry out the steps of:

> issuing a second request to allocate one or more volumes on one of the one or more storage units;

> issuing a third request to make a concatenated volume using the one or more allocated volumes;

> causing the concatenated volume to be configured for use with the host processor;

> issuing first instructions to the one or more storage units to bind the host processor to the concatenated volume by giving the host processor access to the concatenated volume;

> issuing second instructions to the gateway device to bind the concatenated volume to the host processor.

57.   (Previously Presented) An apparatus as recited in Claim 56, wherein the control processor is further configured to carry out the steps of:

> determining that the second instructions have failed to bind the concatenated volume to the host processor;

> issuing third instructions to the one or more storage units to un-bind the host processor from the concatenated volume;

determining that the first instructions have failed to bind the host processor to the
concatenated volume; and

issuing fourth instructions to the one or more storage units to break the concatenated
volume.

58. (Cancelled)

59. (Currently Amended) An apparatus as recited in Claim 50, wherein:

the one or more logical units associated with the host processor include at least a first
logical unit from a first volume of a first storage unit of the one or more
storage units and at least a second logical unit from a second volume of a
second storage unit of the one or more storage units; and

the request to allocate storage specifies a ~~parameter selected from the group consisting
of an amount of storage to be allocated and a~~ type of storage to be allocated; ~~;~~

~~the control processor is separate from the gateway device, the host processor, and the
one or more storage units; and~~

~~the gateway device is separate from the control processor, the host processor, and the
one or more storage units.~~

60. (Currently Amended) A method as recited in Claim 1, wherein the host processor
does not ~~determine~~ know which one or more logical units in the plurality of logical units are
associated with the host processor.

61. (Previously Presented) A method as recited in Claim 1, wherein:

the one or more logical units are associated with one or more logical unit numbers;
and

the host processor does not know the one or more logical unit numbers for the one or
more logical units that are associated with the host processor.

62. (Previously Presented) A method as recited in Claim 1, wherein:

the host processor is a first host processor;

the one or more logical units include a first logical unit and a second logical unit;

the one or more storage units include a first storage unit and a second storage unit;

the first logical unit is associated with the first storage unit;

the second logical unit is associated with the second storage unit;

the control processor associates the first logical unit and the second logical unit to the
first host processor at a first time; and

the method further comprises:

at a second time that is after the first time, the control processor associating the second
logical unit with a second host processor by:

the control processor configuring the gateway device to map the second logical
unit to the second host processor instead of the first host processor;

the control processor configuring the second storage unit to give the second
host processor access to the second logical unit instead of the first host
processor;

wherein the second host processor does not determine that the second logical
unit is associated with the second host processor;

wherein the first logical unit remains associated with the first host processor;

at a third time that is after the second time, the control processor associating the
second logical unit with the first host processor by:

the control processor configuring the gateway device to map the second logical
unit to the first host processor instead of the second host processor;

the control processor configuring the second storage unit to give the fist host
processor access to the second logical unit instead of the second host
processor;

wherein the first host processor does not determine that the second logical unit
wherein the first host processor does not determine that the second
logical unit is associated with the first host processor; and

wherein the first logical unit remains associated with the first host processor.

63.   (Currently Amended) A computer-readable medium as recited in Claim 40, wherein
the host processor does not ~~determine~~ know which one or more logical units in the plurality of
logical units are associated with the host processor.

64.   (Previously Presented) A computer-readable medium as recited in Claim 40, wherein:

the one or more logical units are associated with one or more logical unit numbers; and

the host processor does not know the one or more logical unit numbers for the one or more logical units that are associated with the host processor.

65. (Previously Presented) A computer-readable medium as recited in Claim 40, wherein:

the host processor is a first host processor;

the one or more logical units include a first logical unit and a second logical unit;

the one or more storage units include a first storage unit and a second storage unit;

the first logical unit is associated with the first storage unit;

the second logical unit is associated with the second storage unit;

the control processor associates the first logical unit and the second logical unit to the first host processor at a first time; and

the computer-readable medium further comprises one or more sequences of instructions which, when executed by the control one or more processors, cause the one or more processors to carry out the steps of:

at a second time that is after the first time, the control processor associating the second logical unit with a second host processor by:

the control processor configuring the gateway device to map the second logical unit to the second host processor instead of the first host processor;

the control processor configuring the second storage unit to give the second host processor access to the second logical unit instead of the first host processor;

wherein the second host processor does not determine that the second logical unit is associated with the second host processor;

wherein the first logical unit remains associated with the first host processor;

at a third time that is after the second time, the control processor associating the second logical unit with the first host processor by:

the control processor configuring the gateway device to map the second logical unit to the first host processor instead of the second host processor;

the control processor configuring the second storage unit to give the fist host
processor access to the second logical unit instead of the second host
processor;

wherein the first host processor does not determine that the second logical unit
wherein the first host processor does not determine that the second
logical unit is associated with the first host processor; and

wherein the first logical unit remains associated with the first host processor.

66.   (Currently Amended) An apparatus as recited in Claim 50, wherein the host processor
does not ~~determine~~ know which one or more logical units in the plurality of logical units are
associated with the host processor.

67.   (Previously Presented) An apparatus as recited in Claim 50, wherein:

the one or more logical units are associated with one or more logical unit numbers;
and

the host processor does not know the one or more logical unit numbers for the one or
more logical units that are associated with the host processor.

68.   (Previously Presented) An apparatus as recited in Claim 50, wherein:

the host processor is a first host processor;

the one or more logical units include a first logical unit and a second logical unit;

the one or more storage units include a first storage unit and a second storage unit;

the first logical unit is associated with the first storage unit;

the second logical unit is associated with the second storage unit;

the control processor associates the first logical unit and the second logical unit to the
first host processor at a first time; and

the control processor is further configured to carry out the steps of:

at a second time that is after the first time, associating the second logical unit with a
second host processor by:

configuring the gateway device to map the second logical unit to the second
host processor instead of the first host processor;

configuring the second storage unit to give the second host processor access to
the second logical unit instead of the first host processor;

wherein the second host processor does not determine that the second logical
unit is associated with the second host processor;

wherein the first logical unit remains associated with the first host processor;

at a third time that is after the second time, associating the second logical unit with the
first host processor by:

configuring the gateway device to map the second logical unit to the first host
processor instead of the second host processor;

configuring the second storage unit to give the fist host processor access to the
second logical unit instead of the second host processor;

wherein the first host processor does not determine that the second logical unit
is associated with the first host processor; and

wherein the first logical unit remains associated with the first host processor.